

REMARKS

Claims 1-3, 5-25, 27-33, 35-41 and 43-46 are pending while claims 1-3, 5, 8, 11-14, 17, 20, 21, 27, 28, 30-33, 35, 38, 40, 41, 45 and 46 are rejected. Applicants wish to cordially thank the Examiner for the allowable subject matter indicated with respect to claims 6, 7, 9, 10, 15, 16, 18, 19, 22-25, 29, 36, 37, 39, 43, and 44. Claims 1, 13, 15, 28, 31, 32, 35, 40, 41, and 45 have been canceled, while claims 2, 5, 6, 7, 9, 11, 16, 18, 27, 29, 30, 33, 36, 38, 39, 43, 44, and 46 have been amended in accordance with the subject matter indicated as being allowable. Claims 2-3, 5-12, 14-25, 27, 29, 30, 33, 36-39, 43, 44, and 46 remain for consideration upon entry of the present amendment. No new matter has been added.

Drawings

The drawings stand objected to because the Examiner alleges that Figure 1 should include cutting plane lines corresponding to the cross-sectional views of Figures 2 and 3, the rotation axis (16) in Figure 3 should be rotated by 90 degrees the cross-sectional view of Figure 6 (filed Sept. 3, 2002) must include cross-hatching, the tooth flanks in Figure 6 are incorrectly labeled. Corrected drawings as required in reply to the Office action is submitted herewith in addition to cross-hatching added in Figure 5. No new matter has been added. Accordingly, it is respectfully requested that the objection to the drawings be withdrawn.

The drawings stand objected to under 37 CFR 1.83(a), as the drawings must show every feature of the invention specified in the claims. The Examiner alleges that therefore, the “axis of rotation of said worm gear is skewed relative to an axis of rotation of said worm” (claim 10 and 44) must be shown.

It is respectfully submitted that this feature is clearly shown with respect to Figures 2 and 3, in that an axis of rotation of said worm gear 14 is shown with reference number “20” and an axis of rotation of said worm 12 is shown with reference number “16”. Moreover, the axis of rotation of said worm gear is skewed relative to an axis of

rotation of said worm is shown and described with reference to reference numerals 36 and 46, as well as lead and helix angles α , β of worm 12 and worm gear 14, respectively, and accompanying amended description in the last paragraph of page 7 of the specification to make explicit that which is inherent in the application as originally filed. No new matter has been added.

Accordingly, it is respectfully requested that the objection to the drawings be withdrawn.

Claim Rejections -35 USC § 112

Claim 13 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Applicants respectfully traverse.

The Examiner alleges that the limitation of claim 13 is unclear because it does not appear to further define the device recited in claim 1. Both claims 1 and 13 have been canceled rendering any rejection thereto moot.

Claim Rejections -35 USC § 103

Claims 1-3, 5, 8, 11-14, 17, 20, 21, 27, 28, 30-33, 35, 38, 40, 41,45, and 46 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Wildhaber (U.S. Patent No. 2,935,887) in view of Rice at al. (U.S. Patent No. 3,176,534). Applicants respectfully traverse.

The Examiner alleges that Wildhaber discloses a worm gear drive having a worm formed with convexly shaped tooth flanks and a worm gear formed with concavely shaped tooth flanks. The Examiner admits that Wildhaber does not disclose the worm and worm gear in double flank contact so that the gears mesh without backlash therebetween. However, the Examiner alleges that it was known to configure a worm gear set so as to be in double tooth flank contact. For example, the Examiner uses prior art to Rice at al. alleging that Rice teaches a worm gear arrangement having a worm in double tooth flank contact with a worm gear. The Examiner concludes that it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the gear arrangement of Wildhaber such that the worm and worm gear are in

double flank contact, as taught by Rice et al., motivation being to provide a gear train having no backlash.

It is respectfully submitted that there is no motivation or suggestion to modify the gear arrangement of Wildhaber such that the worm and worm gear are in double flank contact, as allegedly taught by Rice et al. First, Wildhaber teaches away from such double flank contact illustrated in FIG. 6 and teaches a high load-carrying capacity. See Col. 5, lines 43-44. More specifically and with reference to FIG. 6, Wildhaber discloses that “[t]o avoid actual interference adjacent end 41 of the thread surface 42, the thread surface is relieved at that end. That is the interfering portions of the thread surface are removed. As shown in Fig. 5 a thread surface 42 consists of a working portion 42' and a relieved portion 42'' smaller than the working portion. The latter has no tooth contact in any actual running.” Col. 5, lines 48-54.

Second, Rice et al. teach away from a load-carrying capacity and teach complete double flank contact (not outboard mechanical double flank contact). Rice et al. teach a metallic worm meshing with teeth embossed in a plastic wheel by rotation of the worm itself for hand rotation of the worm when fine tuning capacitors and synchros. Furthermore, Rice et al. teach an axis defining the worm intersecting the worm gear forming a groove illustrated in FIG. 3, quite unlike the configuration disclosed by Applicants.

Further, even assuming that all elements of an invention are disclosed in the prior art, an Examiner cannot establish obviousness by locating references that describe various aspects of a patent applicant's invention without also providing evidence of the motivating force which would have impelled one skilled in the art to do what the patent applicant has done. *Ex parte Levengood*, 28 U.S.P.Q. 1300 (Bd. Pat. App. Int. 1993). The references, when viewed by themselves and not in retrospect, must suggest the invention. *In Re Skoll*, 187 U.S.P.Q. 481 (C.C.P.A. 1975).

Neither Rice et al. nor the worm/worm gear art as a whole provide a reason for one of ordinary skill in the art to modify Wildhaber in the manner required to meet the claims. *In re Laskowski*, 871 F.2d 115, 117, 10 U.S.P.Q.2d 1397, 1398 (Fed. Cir. 1989) (“Although the Commissioner suggests that [the structure in the primary art reference] could readily be modified to form the [claimed] structure, ‘[t]he mere fact that the prior

art could be so modified would not have made the modification obvious unless the prior art suggested the desirability of the modification' ") (citation omitted); *In re Stencel*, 828 F.2d 751, 755, 4 U.S.P.Q.2d 1071, 1073 (Fed. Cir. 1987) (obviousness cannot be established "by combining the teachings of the prior art to produce the claimed invention, absent some teaching or suggestion that the combination be made"). There is no teaching or suggestions to combine elements of the prior art to produce the present invention. Moreover, Wildhaber teaches away from double flank contact as disclosed in Rice et al. The present invention is thus nonobvious.

The Examiner has however, indicated that the limitation of claim 6 (i.e., wherein a [lead] angle of said worm is less than a helix angle of said worm gear) is allowable over the prior art. It is respectfully pointed out that angle β with respect to the worm is correctly identified in FIG. 3 as originally filed, but incorrectly described as the helix angle thereof. It is well known by one skilled in the art that angle β plus 90° corresponds to the helix angle of the worm.

Accordingly, Applicants have amended the claims in accordance with the subject matter indicated with respect to claim 6, thus rendering any rejection to claims 1-3, 5, 8, 11-14, 17, 20, 21, 27, 28, 30-33, 35, 38, 40, 41,45, and 46 moot.

Conclusion

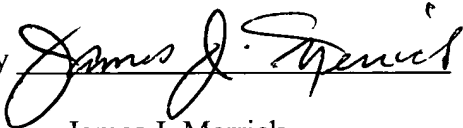
In view of the foregoing points that distinguish Applicants' invention from those of the prior art and render Applicants' invention not obvious, Applicants respectfully request that the Examiner reconsider the present application, remove the rejections, and allow the application to issue.

If the Examiner believes that a telephone conference with Applicants' attorneys would be advantageous to the disposition of this case, the Examiner is invited to telephone the undersigned.

If additional charges are incurred with respect to this Amendment, they may be charged to Deposit Account Number 06-1130 maintained by Applicants' attorneys.

Respectfully submitted,

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